

1. A method of promoting eating appetite, or the gain or maintenance of weight, in a subject comprising administering an effective amount of MCH, or an agonist or fragment thereof, to said subject.

5 2. The method of claim 1, wherein said subject is underweight or exhibits less than normal eating behavior.

3. The method of claim 1, wherein said subject suffers from anorexia nervosa.

10 4. The method of claim 1, wherein said subject is currently or has been administered a treatment which results in decreased eating behavior.

5. The method of claim 1, further comprising diagnosing said subject as being at risk for any of less than normal eating behavior, wasting, or eating disorder.

15 6. The method of claim 1, wherein said subject is a human.

7. The method of claim 1, wherein said subject is administered a second dose of MCH, or an agonist or fragment thereof.

20 *Sulca3* 8 A method of inhibiting eating appetite, or the gain of weight, in a subject comprising administering an effective amount of an antagonist of MCH to said subject.

9. The method of claim 8, wherein said subject is overweight or exhibits 25 compulsive eating behavior.

10. The method of claim 8, further comprising diagnosing said subject as being at risk for any of compulsive eating behavior, obesity, or eating disorder.

30 11. The method of claim 8, wherein said subject is human.

12. The method of claim 8, wherein said subject is administered a second dose of an antagonist of MCH.

35 13. The method of claim 6, wherein said antagonist is a peptide analog of MCH having at least 70% homology with MCH.

14. A method of evaluating a treatment for its effect on eating behavior comprising: administering the treatment to a melanocyte based assay system; determining if

there is a change in said system; and administering the treatment to a second test system, and determining the effect of the treatment on a parameter related to eating behavior or weight gain or loss in the second system.

5        15.    The method of claim 14, wherein said treatment is the administration of an agent and said agent is any of a polysaccharide, a nucleic acid, a fat, polypeptide, or a peptide-mimetic.

10       16.    The method of claim 14, wherein said agent is a polypeptide having at least 50% homology with MCH.

17.    The method of claim 14, wherein administering said treatment to said second test system includes administering said treatment to an animal.

15       18.    A method of evaluating treatment for its effect on eating behavior comprising: providing an animal, cell, or cell culture preparation, having a reporter gene linked to the promoter region of MCH; administering said treatment; and determining if there is an effect on reporter gene expression.

20       19.    The method of claim 18, wherein said treatment is the administration of an agent and said agent is any of a polysaccharide, a nucleic acid, a fat, polypeptide, or a peptide-mimetic.

25       20.    The method of claim 18, wherein said agent is a polypeptide having at least 50% homology with MCH.

30       21.    A method of evaluating an agent for its effect on eating behavior, appetite, or the maintenance of weight comprising: providing an animal, cell, or cell culture preparation, which expresses MC3-R; administering the treatment to the animal, cell, or cell culture; and determining if there is a change in a parameter related to binding of a ligand to MC3-R

35       22.    A method of evaluating a agent for its effect on eating behavior, appetite, or the maintenance of weight comprising: providing a substrate to which MCH binds; contacting the substrate, MCH, and the agent; and evaluating the ability of the compound to promote or inhibit binding of MCH to the substrate.

23.    A method of evaluating a treatment for its effect on eating behavior, appetite, or the maintenance of weight comprising: providing a subject animal; administering the

treatment; and determining if there is an effect on MCH RNA or protein levels, or eating behavior in the animal, provided that the treatment is other than surgical intervention or the oral administration of salt water.

5        24. A method of evaluating an agent for the ability to bind an MCH polypeptide comprising: contacting the agent with the MCH polypeptide, or a purified preparation thereof; and evaluating ability of the compound to form a complex with the MCH polypeptide, provided that the agent is other than other than a rabbit polyclonal antibody.

10        25. A method for evaluating an agent for the ability to modulate an interaction of an MCH polypeptide with a second polypeptide comprising: (i) combining a second polypeptide (or preferably a purified preparation thereof), an MCH polypeptide (or preferably a purified preparation thereof), and the agent under conditions wherein in the absence of the agent, the second polypeptide, and the MCH polypeptide are able to interact, e.g., to form a complex; and (ii) detecting the interaction, e.g., detecting the formation (or dissolution) of a complex which includes the second polypeptide, and the MCH peptide.

20        26. A method of evaluating an effect of a treatment to treat a disorder characterized by unwanted eating behavior, or a condition of under or overweight comprising: administering the treatment to a test cell or organism which carries an MCH transgene or misexpresses a MCH gene, and evaluating the effect of the treatment on an aspect of MCH metabolism.

25        27. A method of determining if a subject mammal is at risk for an MCH related disorder, a weight-related disorder, or an eating or appetite disorder comprising: detecting, in a tissue of the subject, the presence or absence of a mutation of an MCH gene or non wild type levels of MCH RNA or protein.

30        28. A method of making an MCH polypeptide comprising: altering the sequence or ring structure of an MCH peptide, and testing the altered peptide for the desired activity by administering it to an animal and determining its effect on eating behavior or weight.

29. A transgenic MCH cell or transgenic MCH non-human animal.

*rest*

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